Subject: presentation of mf & levels for LR & estuary at EAC mtg 9/3/02 & the draft documents
Date: Wed, 04 Sep 2002 19:45:16 -0700
From: Thomas & Elizabeth Poulson <tomandliz@adelphia.net>
To: jzahina@sfwmd.gov
CC: jaminfo@aol.com, mmorrison@sfwmd.gov, dswift@sfwmd.gov, cmccart@sfwmd.gov, twaterhouse@sfwmd.gov, vanarman@sfwmd.gov, mjmorris@sfwmd.gov

Dear colleagues:

I give the following critique as an ecologist that does long-term (decades) field work to use natural experiments to distinguish among multiple hypotheses. My primary expertise is with cave ecology and management (40 years of research and consultation, including 3 summers as an Ecological Consultant at GS-14, at Mammoth Cave National Park) but I have also worked with succession at Indiana Dunes National Lakeshore and with old-growth forests (especially beech - sugar maple) where I have evaluated multiple hypotheses about forest dynamics over decades to centuries. I have also been on the scientific advisory committee for TNC - Illinois.

I was impressed & largely convinced by your responses to the peer review of you initial document:

1. improvement of the salinity prediction model & verification thereof (John)
2. explanation of how continued change in structures and protocols will further improve the MFLs delivered to the LR (Matthew)
3. multiple criteria for picking a group of plant species that will be surrogates for the "health" of the freshwater parts of the LR (draft document)

I was less impressed by the lack of good criteria for the short-term + or - responses of the freshwater ecosystem to management and natural events like hurricanes and drought. You need to fill in these gaps.

1. Your data on "seedlings" (< breast high) and "saplings" (> breast high & < adult size -- criteria for adult never indicated) are inadequate. You need to go back to what I hope are permanent transects and get detailed data that will give real size-frequency distributions.
   As you point out in your prose, the smallest size classes are the indicators of whether the species are replacing themselves. In this context you need to look at the literature about your indicator species, especially cypress, to see whether they require rare events for regeneration (alternatives include at least periodic drought, periodic floods that create new channels or isolating new oxbows, and/or large windfall gaps)
2. Your prose in several places talks about criteria for stress of living trees but you never either lay out these criteria or provide data. These criteria are at least partially species specific. For example the abundance of epiphytes on cypress & galls may be indicators and the narrowing of trunk growth in cabbage palm may be an indicator. For all species partial defoliation and dieback are criteria.

I was completely unimpressed with your response that you need not push for 50 or 60 cfs mfls NOW because of supposed tradeoffs of the + side of enlarged estuarine areas and - sides of slower restoration. Neither your discussion nor the data from Dent and Ridler

support your suggestion
that the LR estuary has become a prime estuarine habitat. Compared to the Indian River lagoon:

1. red mangrove are less extensive with almost no forests
2. there are no fish or shrimp or oyster data to show that game or food species are
   doing well or even present in the LR estuary
3. the sea grass diversity is much less and not abundant enough for manatee or green turtle
4. manatees like more fresh and less fully saline water

So, I hope you take my comments as the constructive criticism that I intend and further improve
the great job that you have started. I will, of course, be happy to discuss any of the above with any
or all of you.

Take care, Tom

Thomas L. Poulson
Emeritus Ecologist U. Illinois - Chicago
Adjunct Professor in the Honors College FAU - Jupiter
Ecological Consultant to ARM
Short courses in ecology & natural history for kids - adults at Abacoa, HC-FAU, TNC, LLS-FAU

John Zahina's (Loxahatchee MFL Project Manager) Email Response to Tom Poulson regarding comments received in an email sent on September 4, 2002

Hello Tom,

Your comments provided to me are appreciated. Thanks for taking to time to carefully examine the documentation and for giving suggestions of how it can be improved. We will include these with the other comments received, both from the scientific peer review panelists and from the public process, and will address them in our next working of the technical document.

I would like to address your desire to see a minimum flow of 50 to 60 cfs now. I must apologize that I overlooked making a point at the meeting yesterday- that we currently have a management policy of delivering 50 csf to the River as upstream sources are available. Since there is not enough storage in the upstream reaches, we cannot maintain this target when upstream water sources are depleted in dry years. In order to address this, the construction and operation of the G-160 and G-161 (which should be fully operational by 2006) will provide significant additional storage. Although the currently proposed lowest allowable or minimum flow is 35 csf, our current policy of providing a base flow of 50 cfs as upstream sources are available will continue. Additionally, the Northern Palm Beach County Comprehensive Water Management Plan provides for a base flow of 65 csf to be met when its projects are completed. These flow targets do not include additional potential flows that are being investigated from sources in Martin County and from CERP.

Although the vegetation studies discussed in the technical document were conducted in order to discern the locations along the river where the freshwater floodplain community is essentially "healthy" or "significantly harmed", when we embark on developing a restoration plan it is realized that further studies will be required to understand how these communities are structured and how they function. Developing a minimum flow criteria for the River to prevent harm to the existing resource is the target of this project and is only a first step. It is not and should not be confused with restoration. A restoration plan will consider a holistic approach to what is required for the river, including maximum flows, average flows, minimum flows (for the restored community), water quality, and seasonal variation for both the estuary and freshwater reaches of the River. This process will bring in biologists from numerous agencies in order to come to a consensus of what the restored river will look like. Since it is not yet known what a "restored" Loxahatchee River will look like, it is not possible for us to set a minimum flow and level to some (yet undefined) restorative target. This currently proposed minimum flow target will restore the existing/remaining freshwater floodplain community, but when a restoration target is developed it may well need to be revised. The development of a restoration plan for the river is beginning and is expected to take 24-36 months, with the Florida Department of Environmental Protection taking the lead. I believe your concerns expressed to me in your comments will be able to be best addressed in that process. Since that process is only beginning, I hope you will consider participating by contributing from your knowledge and experience, as opportunities are available. Your input and critique will be valuable.

Your interest in the minimum flows and levels project is appreciated. Thanks.

John Zahina

Additional Comments Provided by John Zahina to Tom Poulson on January 31, 2003

Tom,

Your e-mail comments from 9/4/2002 were replied to by myself on 9/5/2002. Below I am attaching a copy of that e-mail response. You e-mailed me back on 9/5/2002 and acknowledged that you had received my response then. A number of significant changes to the document were made in the Final Draft that addressed some of your concerns. I will point them out below. Please be aware that a different effort has already begun to develop restoration targets for the Loxahatchee River- that effort is separate from the MFL (which is not restoration). That effort is being headed up by Patti Sime (South Florida Water Management District) and Melissa Meeker (Florida Department of Environmental Protection). My involvement on the Loxahatchee River was in the development of the MFL. However, the issues of restoration are being handled by this other group- any additional research or development of management criteria is being handled by them. It is an open process and some public meeting have already been held. I would encourage you to "plug in" to that process since they will be dealing with all facets of the river and the watershed, rather than just a minimum flow.

I will address your issues one by one from your initial e-mail

"I was less impressed by the lack of good criteria for the short-term + or - responses of the freshwater ecosystem to management and natural events like hurricanes and drought. You need to fill in these gaps." The MFL is concerned with and legally constrained to consider the conditions that cause "significant harm", which is defined as "the temporary loss of water resource functions, which result from a change in surface or ground water hydrology, that takes more than two years to recover, but which is considered less severe than serious harm" (Chapter 40E-8.21(24), F.A.C.). Droughts fall into a period when one would expect to be at risk for "significant harm" due to low water levels, but hurricanes are not, so were not included in the technical criteria.

"Your data on "seedlings" (< breast high) and "saplings" (> breast high & < adult size --criteria for adult never indicated) are inadequate. You need to go back to what I hope are permanent transects and get detailed data that will give real size-frequency distributions. As you point out in your prose, the smallest size classes are the indicators of whether the species are replacing themselves. In this context you need to look at the literature about your indicator species, especially cypress, to see whether they require rare events for regeneration (alternatives include at least periodic drought, periodic floods that create new channels or isolating new oxbows, and/or large windfall gaps)" With respect to the issue of defining age classes, the language in the technical document was changed to clarify that seedlings were defined as juvenile trees shorter than breast height, and saplings were juveniles taller than breast height but shorter than the canopy height (Appendix C, page C-5, second paragraph). Additional comments in your e-mail included a desire to see a size-frequency distribution analysis. There are insufficient numbers of individuals at a site to do this in a statistically reliable manner with the current data (see Appendix C field data). Also doing this analysis for seedlings from a one-time sampling event would not be appropriate as the number of seedlings counted would vary from month to month. The purpose of this research was to support the development of an MFL, which is to determine the conditions that cause "significant harm" (legally defined above). The data on seedlings/sapling we do have is sufficient to generally gauge where reproduction is occurring and where it is not. But this is only one of several criteria used to determine the point of "significant harm". Periodic floods, creation of new channels, or large windfall gaps are processes that are outside of consideration of a minimum flow criteria (significant harm caused by low water levels). However, research into these things, as well as a size-frequency distribution, may be useful for the team that is heading up the development of restoration targets and management objectives- they may wish to consider conducting the field work to support this analysis. With respect to your interest in

looking at bald cypress requirements for successful reproduction, an entirely new appendix was added to analyze floodplain swamp hydroperiod requirements (Appendix N), which addresses that issue.

"Your prose in several places talks about criteria for stress of living trees but you never either lay out these criteria or provide
data. These criteria are at least partially species specific. For example the abundance of epiphytes on cypress & galls may be indicators and the narrowing of trunk growth in cabbage palm may be an indicator. For all species partial defoliation and dieback are criteria". The criteria were outlined on pages 146 and 147 of the technical document. Data is provided in Appendix C. However, since bald cypress and cabbage palms have been demonstrated to be somewhat salt tolerant, developing criteria based on bald cypress or cabbage palms could allow significant harm to other more sensitive species such as Virginia willow and red maple.

"I was completely unimpressed with your response that you need not push for 50 or 60 cfs mfls NOW because of supposed tradeoffs of the + side of enlarged estuarine areas and - sides of slower restoration. Neither your discussion nor the data from Dent and Ridler support your suggestion that the LR estuary has become a prime estuarine habitat. Compared to the Indian River lagoon: 1. red mangrove are less extensive with almost no forests 2. there are no fish or shrimp or oyster data to show that game or food species are doing well or even present in the LR estuary 3. the sea grass diversity is much less and not abundant enough for manatee or green turtle 4. manatees like more fresh and less fully saline water"
As written in the proposed MFL rule, submitted for publication in Florida Administrative Weekly, the District is committed to providing a flow of 50 cfs, as outlined in the Consent Agreement. As upstream sources of water become exhausted during prolonged dry periods, the flows at Lainhart Dam shall not fall below 35 cfs for more than 20 consecutive days OR the average daily salinity concentration expressed as a 20-day rolling average shall not exceed 2ppt (average for the water column) at River Mile 9.2 The latter language was proposed and written into the rule at the suggestion of public input at the workshops held in December. Since the target problem on the NW Fork is salinity, a statement in the MFL rule limiting salinity at the location of interest seemed necessary. As part of the MFL rule, the Water Management District has acknowledges that this MFL is interim, will be reviewed in two years, and aligned with the restoration targets that are currently being developed by the Water Management District and the Florida Department of Environmental Protection. With respect to establishing a minimum flow of 50-60 cfs at Lainhart Dam for the NW Fork, I provided an explanation in my previous e-mail. In addition, a study of floodplain hydroperiod (Appendix N), indicates that not allowing a periodic drawdown of surface water levels within the upper floodplain swamp would be potentially damaging to the swamp. Seeds can only successfully germinate and become established if there is enough time without surface water for them to become established (Appendix N, pages N-5, N-15). Much of the floodplain remains inundated at the flows above 50 cfs (Table 8, page N-11) and never permitting a draw down period would create an unnatural hydroperiod that can be as damaging to a swamp as too little water. With respect to
your comments on the estuary, we recognize that this MFL is to protect the remaining freshwater swamp forest along the NW Fork. Hence, the title of the document has changed to reflect this and no longer refers to the estuary. The group who is currently developing restoration targets are considering the entire river, including freshwater, estuarine, and marine areas, as well as the entire watershed.

I hope that these points address your comments. Please contact me if you have any further questions. I would like to encourage you to become involved in the ongoing process to develop restoration targets for the Loxahatchee River by attending public input meetings. The last one was held on December 17th in Jupiter and that gave the public the opportunity to put into map format their vision for ultimate restoration targets for the Loxahatchee. More information of that effort can be found at the FDEP's website at:
http://www.dep.state.fl.us/southeast/

John Zahina